

NOTE ON A GYNANDROMORPH IN AMBLYOPONE
AUSTRALIS ERICHSON
(HYMENOPTERA: FORMICIDÆ)

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With the exception of Wheeler's report of an antero-posterior gynandromorph in *Ponera coarctata pennsylvanica* Buckley (1931) and Tulloch's description of a gynergate in *Promyrmecia aberrans* Forel (1932) there have been relatively few cases reported of either sex or caste mosaics in Ponerine ants, despite the rather numerous cases of such mosaics reported in higher forms by Wheeler (1914, 1919, 1923, 1931, 1937) and others. The occurrence of a roughly bilateral queen-male gynandromorph in the archaic Australian Ponerine ant *Amblyopone australis* Erichson, therefore seems worth recording.

This individual was found in a group of cocoons and workers of *A. australis* which had been collected by Mr. John Clark at Ferntree Gully, near Melbourne in Victoria, and most kindly sent to the authors in a living condition. When received, on February 25, 1947, the majority of the cocoons had hatched, disclosing predominantly sexual adult forms, most of which were living. The gynandromorph was found dead among the debris of the nest, evidently having hatched during shipment and died very shortly before being found, since it was in perfect condition and the portions of female tissue still showed the rich red callow coloration characteristic of the species. It showed no evidence of having been molested by other adults. The fact that it had hatched successfully was rather remarkable, since, as one of the mandibles was of the short, slightly developed form characteristic of the male, while the other was of the huge, projecting structure characteristic of the female, it can hardly have emerged through its own efforts. This suggests that, although young imagoes of *Amblyopone australis* are fully capable of emerging from their cocoons without the assistance of adult nurses, they may receive such assistance under normal conditions.

This distribution of male and female tissue was roughly bilateral in the head and thorax of the gynandromorph, the right

side being female, the left, male. The right antenna, eye, and mandible were typically female, the left antenna, eye, and mandible typically male. Three ocelli were present. There was some intrusion of male tissue to the right side of the median line near the posterior border of the head, and some intrusion of female tissue to the left side in the clypeal region. The pigmentation and sculpturing of both male and female tissue were typical of the species, thus presenting a decided contrast between the dense black of the male (which is fully pigmented on emergence) and the bright reddish brown of the female (which normally retains the callow coloration several days after hatching).

Although the thorax, like the head, showed a roughly bilateral distribution of male and female tissue, it was more nearly a mosaic, with about three-quarters of the area showing male form, pigmentation, and sculpturing. The left wings were male, and fully expanded. Wings were present on the right side, but imperfectly expanded. In each of the left legs, the femur resembled that of the typical male and was deeply pigmented. The tibia and tarsus were pigmented as in the female. Each of the right legs showed characteristic female pigmentation, except that the femur was a little darker than normal. The gaster was of female structure, sculpturing and pigmentation throughout.

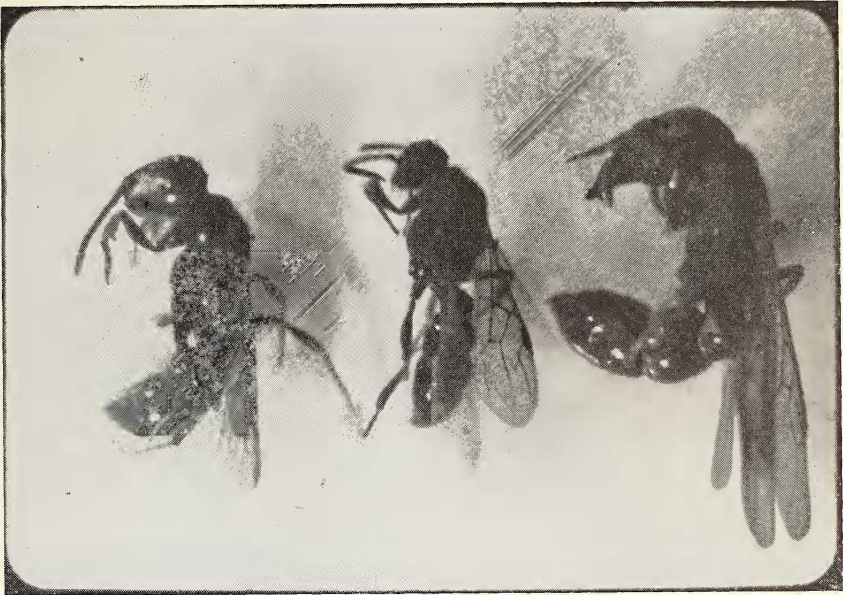
In stature and body measurements the gynandromorph was intermediate between the normal measurements for males and females of *A. australis*. Measurements for the width of the head, taken along the dorsal surface on a line passing through the centers of the compound eyes, and of the total body length, compared with similar measurements for a perfect female and male of the same brood, are given in Table I below.

TABLE I

	Head Width (mm.)	Total Body Length (mm.)
Perfect female	6.0	27.8
Perfect male	3.6	16.0
Gynandromorph	4.4	19.4

The general appearance of the individual, compared with a perfect female and male of its own brood, is shown in Plate VIII.

In its general habitus and in the distribution of male and



Gynandromorph of *Amblyopone australis* Erichson compared with Female and Male of Same Brood.

female tissue, this specimen is characteristic of many gynandromorphs of higher ants which have been described. It is suggestive that, whatever may be the mechanisms underlying sex determination in ants, they were clearly well established at a very archaic period in social development, if indeed (as seems most likely) they were already not well established among the solitary Aculeate progenitors of the ants long before the assumption of the social habit or the evolution of caste dimorphism in the female.

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